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By-Beanblossom, Gary F.

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General examinations of the College Level Examination Program (CLEP) were administered in Fall 1968 to 333 students who had entered the University of Washington as freshmen in Fall 1966 and had completed 80-100 credits by Spring 1968. The tests were conducted to measure proficiency in lower division studies, particularly in the areas of natural science, social science and humanities. This report describes and analyzes test data bearing most directly on 3 questions: (1) How do students in different fields perform on the 3 general CLEP exams? (2) Does repeated exposure to liberal art courses result in greater knowledge as measured by CLEP exams? (3) To what extent is it possible to equate CLEP performances in different liberal arts areas with credits in these areas? Extensive figures and tables illustrate the findings in the text. (JS)

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Bureau of Testing

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The Use of CLEP Scores in Evaluating Liberal Arts Curriculum

Gary F. Beanblossom

Introduction. The general examinations of the College Level Examination Program (CLEP) were administered Autumn Quarter 1968 to 333 students who entered the University for the first time as freshmen Autumn Quarter 1966 and had completed between 80 and 100 credits by Spring Quarter 1968. The testing was conducted to evaluate student proficiency as related to lower division study with particular emphasis on measuring knowledge in three areas encompassed by various college distribution requirements, namely natural science, social science, and humanities. The three CLEP general examinations, i.e., natural science, social science-history, and humanities, were judged suitable for this purpose. A more complete description of the testing proposal, as originally conceived, can be found in an earlier statement prepared by Thomas F. Hodgson, "A Proposal for a New Testing Program."

This report describes and analyzes test data that bear most directly on three questions of overriding concern:

1) How do students in different fields perform on the three general CLEP examinations?

2) Does repeated exposure to liberal arts courses result in greater knowledge as measured by CLEP exams?

3) To what extent is it possible to equate CLEP performances in different liberal arts areas with credits in these areas?

Bureau of Testing Project 0668-102

The Sample. During the summer of 1968 a list of names of 1,589 University students was compiled by the Office of Institutional Educational Research in collaboration with the Registrar's office using the following criteria: (a) the students entered the University as freshmen directly from high school in Autumn Quarter 1966 and (b) had earned between 80 and 100 credits by June 1968. Thus the original sample consisted of students completing approximately two years of undergraduate study at the University who had made "normal" progress during this phase of their undergraduate careers. These students were contacted by letter last summer, informed of the testing program, and offered a flexible schedule of test sessions over Autumn Quarter 1968 from which they could select preferred dates. In an attempt to secure maximum cooperation positive features were stressed such as the importance of the test for general curriculum evaluation, the advantages of educational self-appraisal through test performances, and the possibility of waiving some lower division course requirements not completed. However, only 333 of the 1,589, a little better than 20 per cent, volunteered for the four-hour sequence of examinations.

Kinds of Data Obtained. The following data were gathered for the 1,589 students to whom letters were mailed:

1) high school GPA
2) All-University GPA
3) number of credits completed in social science
4) number of credits completed in natural science
5) number of credits completed in humanities
6) total number of credits completed
7) college
8) major
9) sex

Among those taking the tests three additional subject area GPA's were computed from the student transcripts: a GPA in social science courses, a GPA in natural science courses, and a GPA in humanities courses. Subject

area credits were determined by referring to the "College List" classification of courses in the Arts and Sciences section of the University of Washington Bulletin. A further classification by major field was devised for Arts and Sciences majors. Majors were categorized into three broad groupings, social science, natural science, and humanities. Certain majors could not be classified in this manner and were therefore excluded, e.g., pre-major, physical and health education, pre-business, home economics, radio-TV, recreation education, and general studies.

Biases in the Sample of Volunteers. Establishing norms for a total population based on a small percentage of volunteers is normally a risky and hazardous undertaking since volunteers and non-volunteers quite often differ in other respects pertinent to the conclusions a study eventually formulates. One way to assess the types and magnitudes of certain biases is through a comparison of volunteers with non-volunteers on characteristics conceivably associated with findings produced by the study. Since a major portion of the data gathered for this study was also available for the 1,256 non-volunteers, comparisons between the two groups were possible. These comparisons are shown in Table 1.

An inspection of the data in Table 1 shows students taking the tests to have slightly higher high school and all-U GPA's than those not taking the tests. There also are differences in the mean number of credits in the three liberal arts areas between the two groups; participants, on the average, have completed considerably more natural science courses, have slightly more humanities credits, and slightly fewer social science credits. The College of Arts and Sciences is overrepresented among those tested; more than 70 per cent are Arts and Sciences majors compared with 60 per cent of those not tested. Conversely there are smaller percentages in other colleges among the volunteer group with the lone exception of Architecture. Undoubtedly a great

many students electing to take the exams did so with the idea that high scores could mean at least partial waiver of certain distribution requirements. Since these requirements are generally much more demanding in Arts and Sciences than in other colleges, test participation may have offered little in the way of practical incentives for students enrolled in other colleges.

Table 2 classifies Arts and Sciences majors into the major fields of social science, natural science, and humanities, and furnishes additional comparisons on rates of participation. At the bottom of the table it can be seen that about 21 per cent of the original sample participated in the testing. This compares with figures between 15 and 17 per cent for students in Business Administration (including pre-BA's in Arts and Sciences), Education, Engineering, and Nursing. Arts and Sciences pre-majors show a 19 per cent participation rate, humanities 20 per cent, social science 23 per cent, and natural science, a relatively high 34 per cent. Thus natural science majors are largely responsible for the preponderance of Arts and Sciences majors in the test sample. This may also explain the slightly higher GPA's among participants as well as the greater number of natural science credits.

There are also differences in rates of participation between majors within categories. Among natural science majors those in chemistry, mathematics, and oceanography were most receptive to CLEP whereas pre-dentistry and pre-dental hygiene were least receptive. Art, music, and English, among the humanities, had low rates of participation while, on the other hand, the exams were considerably more popular with students in Germanic languages, journalism, and Spanish. The Arts and Sciences pre-majors, a rather formidable group even at this middle stage of undergraduate education, did not demonstrate an especially favorable response rate to CLEP.

The biases noted above almost certainly raise the mean natural science attainment above what would have been obtained had the sampling been more representative. Given the high intercorrelations among the exams, about which more will be said, it is likely that mean attainments on the other exams would also be slightly higher for this sample. These disparities are probably not large enough to be worrisome. Some of the more subtle biases that a volunteer sample can introduce are not readily divulged by the kinds of comparisons made here. Hopefully these too are not serious.

The CLEP Exams. Each of the three exams contains 100 items and is timed for 75 minutes. A pair of subscores is available for each exam. The subsections overlap, that is some items are included in both subscores. The social science-history exam has a social science subscore and a history subscore. The natural science exam produces biological science and physical science subscores. Humanities consists of fine arts and literature. Data were gathered on subscores as well as total scores but the major portion of the analysis focuses on the three total scores.

Exam Performances by Major Field of Study. Tables 3 and 4 and Figure 1 compare performances on CLEP by major field of study. Arts and Sciences majors were again categorized into the broad groupings of social science, natural science, and humanities, using the classification rules depicted in Table 2. Arts and Sciences pre-majors make up a fourth category. Eighteen Arts and Sciences students were majoring in fields that could not be categorized. The other major colleges, Architecture, Business Administration, Education, Engineering, and Nursing each formed a single group. It should be remembered that very small numbers are associated with some fields, particularly architecture, business, and nursing; their mean scores are displayed mostly for

expository purposes. The remaining fields, though not as large as we might like, are probably large enough to furnish fairly reliable mean scores.

There are impressive differences between fields with respect to CLEP performances as seen from an inspection of mean comparisons of the nine scores shown in Table 3. Perhaps a more striking affirmation of these differences can be seen from Figure 1 where major field means for the three total scores are expressed as percentiles based on the entire sample of 333. Social science majors are easily the most superior group in social science-history, do quite well in humanities, but drop below the average in natural science. Natural science majors show exceedingly high attainments, as one might expect, in natural science, but also perform more than creditably on the other two exams. Humanities majors, though conspicuously high in humanities, are only average in social science-history, and considerably below average in natural science. The Arts and Sciences pre-majors are a relatively undistinguished group, scoring between the 40th and 50th percentiles on all three exams.

The profiles for education and engineering are illuminating if only because they show dramatic peaks and valleys. Engineers, in stereotypic fashion, are a strong second to natural science majors in natural science knowledge, but rank at the bottom in humanities. They do about average in social science-history. These data show education majors greatly lacking in natural science knowledge, low in social science-history, yet better than average in humanities. Students in architecture, business, and nursing, again keeping in mind the small numbers, do not generally perform well on these exams, though business students do better than average in social science and nurses are about average in humanities.

A juxtaposition of Figure 1 with Table 3 shows that a major field's relative position on the total scores is sometimes affected differentially by the two subscores. For instance, high standing of engineers in natural science is due entirely to achievement in physical science since they are in fact below average in biological science, while nursing, though occupying a low position on the total score, is about average in biological science. Business students do much better in social science than history; nurses are much better in fine arts than literature.

Some of these differences can be explained in part by the sex composition of the major fields since males attain higher scores on the two science exams and females do somewhat better in humanities. This may partially account for the contrasting profiles of engineering, a male dominated field, and education, a female dominated field, regarding the natural science and humanities exams.

At first glance it might appear that these data provide uncontestable evidence for high exam validities. It should be borne in mind however that for the most part major fields showing higher mean attainments on certain exams normally are characterized by more course exposure in these areas and would be expected to perform better even if the exams possessed only modest validities.

Comparisons with the National Norm Group. Students completing their sophomore year at various colleges throughout the nation comprise the national norm group. It is unclear just how the norming procedures were carried out but judging from the schools which make up the national norming sample, it is reasonably clear that these norms are not very useful for university populations, since small state colleges and junior colleges are

numerically paramount. This is further evidenced from data in Table 4, to which raw score means in Table 3 have been converted.

A CLEP Score is a standard score having a mean of 50 and a standard deviation of 10. Hence a CLEP of 50 corresponds to the 50th percentile, 55 to about the 70th percentile, and 60 to approximately the 84th percentile. Since most means in the UW sample cluster around the middle and high 50's, and indeed many exceed 60, it is commonplace for UW students to attain scores which would place them in the 80's and 90's of the national percentiles. The test publishers seem to sense the disutility of such comparisons for certain schools when they urge institutions to generate their own norms whenever possible. This was done for the UW sample and raw score-percentile equivalents for the nine scores are reported in Tables 8 through 11.

Relative to the national norm group, UW students perform much better in social science-history and natural science than humanities; the natural science mean CLEP score is 59.3, social science-history is 57.3, and humanities only 52.8. The social science and history subscores are highly divergent, attainments in social science being much higher than in history.

Correlations. A correlation coefficient is a measure of relationship between two variables. It can vary in magnitude from 0 (no relationship) to 1 (perfect relationship). The direction of the relationship, i.e., direct or inverse, is indicated by a positive or negative sign. Table 5 intercorrelates variables for the total group tested. There are nine test score variables (three total scores and six subscores), three credit variables (in social science, natural science, and humanities), five GPA variables (high school GPA, all-University GPA, and GPA's in the three subject areas), and sex. What major conclusions can be reached from the correlational data?

1. Exceptionally high correlations exist between the three CLEP total scores. Social science-history correlates .54 with natural science and .54 with humanities; even natural science and humanities, areas quite different in content, correlate .38. This means that students who do well in one area are very likely to do well in the other two areas. Though positive correlations would be expected, the magnitude of the correlations is a little disquieting, especially when one considers that students with many credits in natural science (and hence high scores) are apt to have few credits in social science and humanities (and hence presumably lower scores).
2. The question about whether repeated exposure to liberal arts courses results in greater knowledge can be answered "definitely yes" regarding natural science (+.56), "to some extent" regarding humanities (+.33), and "hardly at all" regarding social science (+.14).
3. The better students, i.e., those attaining better high school grades, are more likely to concentrate their course work in natural science, but also do very well on the social science-history and humanities exams relative to their moderate course exposure in these subjects.
4. GPA's in social science and humanities are only mildly associated with exam performance in these areas (+.23 and +.29, respectively), though in social science this represents an improvement over the credit-exam relationship. Natural science GPA shows a considerably higher association with exam score (+.44).
5. Females, while making slightly better grades than males, perform rather poorly on the natural science and social science-history exams, even though taking more courses in social science. Women are

slightly better achievers in humanities but again tend to take many more credits.

Figure 2 presents a pictorial representation of the relationships noted above between subject area credits and exam scores. Credit intervals were constructed, e.g., 0-4, 5-9, 10-14, etc., for each subject area and a mean score for the corresponding CLEP exam was computed for each credit interval. The means were then plotted. The three curves show some interesting properties. For one thing, humanities credits do not markedly enhance CLEP performance at the lower end of the credit distribution. Beyond about 20 credits, however, there is a gradual upward slope, apparently a reflection of high scores attained by humanities majors. As natural science credits increase the natural science exam score surges upward over the entire range of credits, except for one sharp dip in the curve, which may be more an artifact than real since the mean for this credit interval was based on a small number of cases. The social science curve shows an upward shift at the extreme upper end of the credit range but for the most part consists of a series of pattern-less points. Interestingly enough, students with fewer than five credits in social science (N=33) attain a mean score of 46.7 which is less than two points under the overall mean of 48.4.

Why the Low Credit-Exam Score Relationship in Social Science? There would seem to be at least four interacting factors responsible for the fact that natural science course exposure substantially increases natural science knowledge while social science course exposure is virtually unrelated to social science knowledge:

1. The exams themselves, given the high intercorrelations, are, to a considerable extent, measuring a common underlying factor,

perhaps reading speed and comprehension or some facet of general academic competence.

2. The better students distribute their course work disproportionately in favor of natural science.
3. Knowledge of the social sciences and history, being relatively subjective and general in nature, can be readily acquired through outside reading and educational experience originating outside the university context.
4. The course curricula in the natural sciences is more highly structured and in most departments course prerequisites more likely ensure that students will acquire a prescribed level of knowledge before proceeding to the more advanced courses.

Data in Table 6 are relevant to the first two factors above. Twenty Arts and Sciences majors containing at least four students were ranked on mean credits and mean exam scores in the three subject areas. It is obviously apparent that the natural science majors, especially chemistry, oceanography, pre-medicine, and zoology, all of which rank low on social science credits but high on the social science-history exam, have something to do with the low overall correlation between social science credits and social science-history exam score; chemistry ranks 20th in credits but 12th in exam score, oceanography 18th in credits but 4th in exam score, pre-medicine jumps from 16.5 to 5.5, and zoology, 15th to 5.5. These natural science majors also rank higher on humanities scores than their credit ranks might suggest, but the discrepancies are not quite as exaggerated as with social science-history.

But it would be a mistake to attribute the low credit-exam associations in social science solely to the interaction of ability or general intelligence with credits completed. Credit-exam correlations (not shown here) were computed separately for the social science majors, natural science majors, humanities majors, and pre-majors. Despite improvements in the social science credit-exam relationship, in no instance did they exceed .32, furnishing some empirical justification for the second two explanations above. Natural science credit-exam correlations remained high, and humanities relationships were improved only slightly.

In summary the evidence fails to show that repeated exposure to social science and humanities courses greatly increases knowledge in these areas, as measured by CLEP exams. Course exposure does appear to be a key element in the acquisition of natural science knowledge.

Equating Credits with Exam Scores. The failure to obtain sufficiently high correlations between credits and CLEP scores in social science and to a lesser extent in humanities may be seen as reason enough to abandon the search for an effective method of equating credits with exam scores. But the argument that students achieving high exam scores, notwithstanding statistical results, should be granted partial waiver of credit requirements would seem to have much merit. At the same time an equally cogent argument can be made for the probable value of course work over and above that which can be precisely measured by an examination. A desirable compromise would involve requiring a minimum level of course exposure as well as a minimum exam score before waiving the remaining credits that a student may need to meet the 20 or 30 credits necessary to satisfy distribution requirements. The course exposure stipulation might be removed for students attaining

extremely high exam scores. The following proposal was approved by the Graduation Committee of the College of Arts and Sciences on February 20, 1969:

1) A combination of the number of credits previously taken in a given subject area and the subject area exam score was used to determine whether students qualify for 30 credits or 20 credits in the area. Those unable to qualify for 20 credits may qualify for 10 credits on the basis of the exam score alone.

2) A percentile method was used to determine the exam scores required for 30, 20, and 10 credits. The exam score corresponding to 30 credits in a subject area was the exam score attained by the same percentage of students who had completed 30 credits of less in the subject area. For example, if 40 percent of the students completed more than 30 credits in a subject area an examinee would be required to score at the 60th percentile on the appropriate exam to be awarded 30 credits. The same procedure was carried out to obtain exam score equivalents for 20 and 10 credits.

3) To qualify for 30 credits in a subject area a student must have completed at least 15 credits in addition to meeting the exam score requirement for 30 credits; to qualify for 20 credits in a subject area a student must have completed at least 10 credits in addition to meeting the exam score requirement for 20 credits.

4) Students scoring at the 90th percentile or above on CLEP automatically qualify for 30 credits regardless of past course experience; those scoring at the 75th percentile or above automatically qualify for 20 credits regardless of past course experience.

There are then three different paths via which a 30-credit requirement in a subject area can be fulfilled: (a) taking 30 credits of course work in the subject area; (b) taking 15 credits of course work in the subject area and attaining the CLEP score equivalent of 30 credits; (c) achieving a 90th percentile or better CLEP socre. The 20-credit requirement can be met by earning 20 credits of course work, or ten credits and the CLEP score equivalent of 20 credits, or a 75th percentile CLEP score. Students with less than ten credits in a subject area may qualify for ten credits by achieving the CLEP score equivalent of ten credits.

Table 7 cross-classifies for each subject area credits already earned with CLEP scores. The numbers in the body of each table are the maximum number of credits allowable (either 10, 20, or 30). The number of credits earned must be subtracted from the maximum number of credits allowable to arrive at the number of credits waived. Asterisks denote categories for which no credits are waived, that is, categories where the maximum number of credits allowable does not exceed credits already earned.

It should be re-emphasized that these decisions only affect Arts and Sciences students who participated in the experimental testing. Whether and how this program will be expanded is a decision that will soon be forthcoming.

Table 1

Mean and Percentage Comparisons between Students Taking CLEP (N=333) and Students Not Taking CLEP (N=1256) on High School GPA, All-University GPA, Social Science, Natural Science, and Humanities Credits, College, and Sex

	Tested	Not Tested
High School GPA	3.35	3.27
All-University GPA	2.75	2.61
Social science credits	21.2	22.7
Natural science credits	26.2	22.4
Humanities credits	25.2	23.7
% Architecture majors	2.7	2.2
% Arts and Sciences majors	70.3	60.0
*% Business majors	3.3	5.3
% Education majors	10.8	14.3
% Engineering majors	6.6	9.3
% Nursing majors	4.2	5.7
% Fisheries, Forestry, or Pharmacy	2.1	3.2
% Male	55.0	53.7

*Pre-BA majors in the College of Arts and Sciences were included under Business.

Table 2

Number of Students Tested and Not Tested with CLEP and Percentage Tested within College; Number of Students Tested and Not Tested with CLEP among Majors and Major Fields within the College of Arts and Sciences

Social Science Majors (A&S)	Tested	Not Tested	% Tested
Anthropology	6	12	33.3
Communications	1	4	20.0
Economics	6	17	26.1
Far East	4	13	23.5
Geography	0	3	0.0
History	6	20	23.1
Political Science	6	25	19.4
Pre-Law	7	20	25.9
Psychology	0	2	0.0
Sociology	5	18	21.7
Totals	41	134	23.4
Natural Science Majors (A&S)			
Atmospheric Science	1	1	50.0
Botany	2	1	66.7
Chemistry	13	16	44.8
Genetics	0	0	--
Geology	1	2	33.3
Mathematics	9	11	45.0
Microbiology	2	0	100.0
Oceanography	11	15	42.3
Physics	2	5	28.6
Pre-Dentistry	2	23	8.0
Pre-Dental Hygiene	2	13	13.3

(continued)

Table 2 (continued)

Natural Science Majors (A&S)	Tested	Not Tested	% Tested
Pre-Occupational Therapy	3	5	37.5
Pre-Medicine	11	18	37.9
Pre-Medical Technology	2	6	25.0
Pre-Physical Therapy	3	4	42.9
Preventive Medicine	0	1	0.0
Zoology	14	31	31.1
Totals	78	152	33.9
Humanities Majors (A&S)			
Art	4	41	8.9
Chinese	0	1	0.0
Classics	1	2	33.3
Comparative Literature	1	0	100.0
Drama	2	10	16.7
English	8	49	14.0
French	1	7	12.5
Germanic Languages	4	6	40.0
Greek	0	1	0.0
Italian	0	0	--
Japanese	0	0	--
Journalism	11	27	28.9
Korean	0	0	--
Latin	0	0	--
Music	1	10	9.1
Norwegian	0	0	--
Philosophy	1	2	33.3

(continued)

Table 2 (continued)

Humanities Majors (A&S)	Tested	Not Tested	% Tested
Romance Languages	0	3	0.0
Russian	3	3	50.0
Spanish	5	9	35.7
Speech	1	1	50.0
Swedish	0	0	--
Totals	43	172	20.0
Pre-Majors (A&S)	61	258	19.1
Others (A&S)			
General Studies	3	13	18.8
Health Education (Men)	0	0	--
Health Education (Women)	0	1	0.0
Home Edonomics	4	18	18.2
Physical Education (Men)	0	0	--
Physical Education (Women)	0	2	0.0
Radio-TV	3	7	30.0
Recreation Education (Men)	0	0	--
Recreation Education (Women)	0	0	--
Totals	10	41	19.6
Arts and Sciences Total	233	757	23.5
Architecture	9	28	24.3
*Business	11	60	15.5
Education	36	180	16.7
Engineering	22	117	15.8
Nursing	14	72	16.3
Fisheries, Forestry, Pharmacy	8	39	17.0
Grand Totals	333	1253	20.9

*Pre-BA majors in the College of Arts and Sciences were included under Business.

Table 3

Raw Score Means of the Three General CLEP Examinations and Subscores by Field of Study

N	Field of Study	Hist Subs	SoSc Subs	SoSc &His Tot	Biol Subs	Phys Sci Subs	Nat Sci Tot	Fine Arts Subs	Lit Subs	Hum Tot
41	Social Science (A&S)	27.8	36.2	54.8	27.4	28.6	51.5	18.1	19.9	35.9
78	Natural Science (A&S)	23.7	33.9	49.7	35.1	35.3	65.6	18.4	17.3	34.2
43	Humanities (A&S)	23.7	32.5	48.1	26.7	27.4	49.7	22.0	20.3	40.0
61	Pre-Major (A&S)	22.6	33.1	47.5	26.1	26.9	49.5	16.3	16.2	30.9
9	Architecture	20.2	31.8	43.9	23.7	29.7	49.1	17.3	12.2	28.6
11	Business*	21.8	36.1	48.9	27.2	26.1	49.1	14.2	12.3	25.5
36	Education	21.2	31.1	44.7	24.4	22.7	43.9	17.0	17.8	33.3
22	Engineering	23.9	31.5	47.8	27.7	36.1	59.5	13.6	12.4	24.9
14	Nursing	18.2	29.2	41.1	28.7	24.1	49.1	19.3	14.8	32.4
18	Others									
333	Total	23.3	33.2	48.4	28.5	29.3	53.7	17.8	17.0	33.1

*Included in Business are six Pre-BA majors in the College of Arts and Sciences.

Figure 1

Profile of Mean Performances on the Three General CLEP Examinations by Field of Study

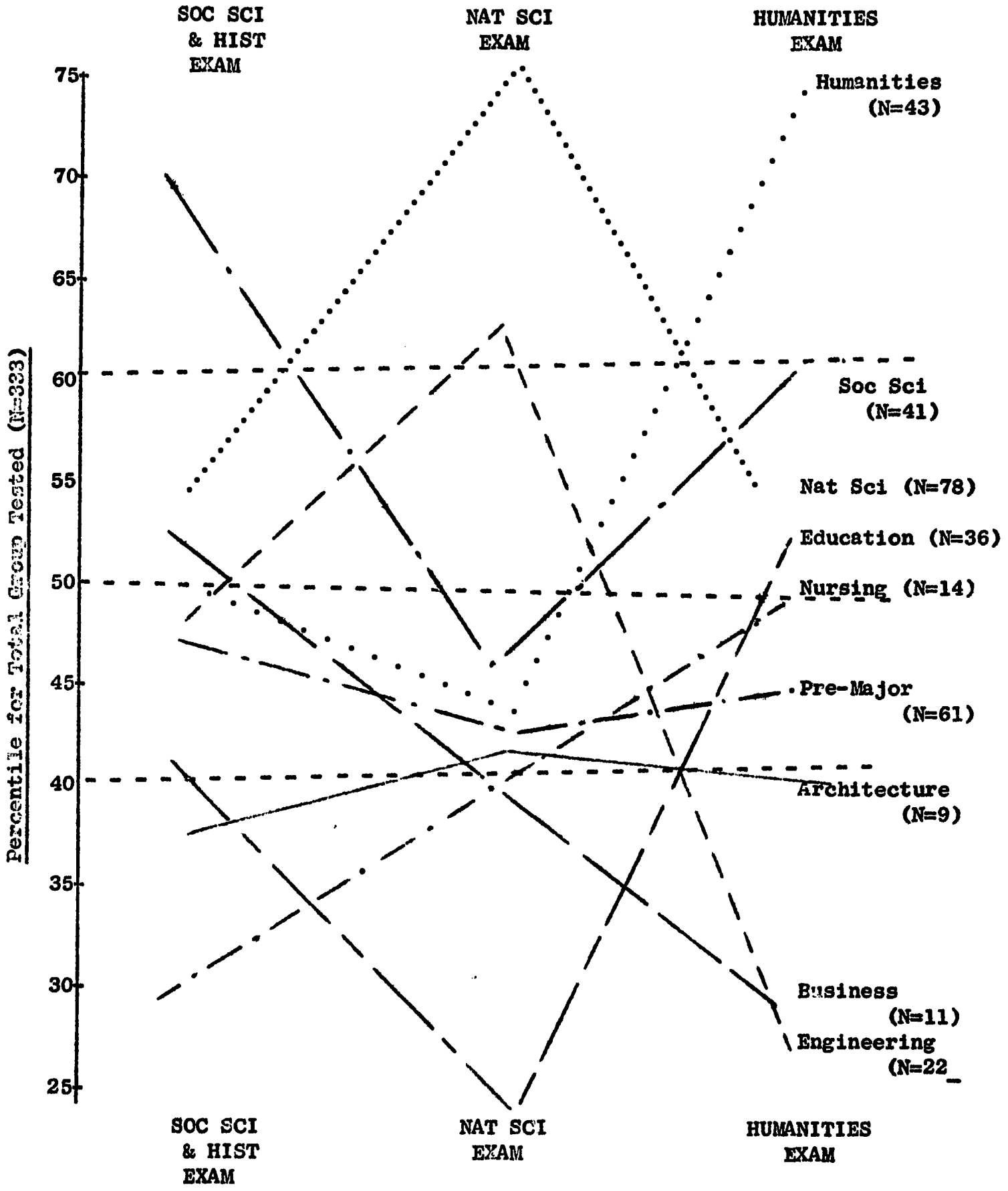

Table 4

National Norm Equivalents (Mean = 50 and Standard Deviation = 10) Based on Total National Sample for the Three General CLEP Examinations and Subscores by Field of Study

N	Field of Study	Hist Subs	SoSc Subs	SoSc &His Tot	Biol Subs	Phys Sci Subs	Nat Sci Tot	Fine Arts Subs	Lit Subs	Hum Tot
41	Social Science (A&S)	58.4	62.8	60.9	58.0	58.8	58.0	53.8	54.1	54.4
78	Natural Science (A&S)	54.6	60.6	58.0	66.3	65.1	65.9	54.1	51.6	53.4
43	Humanities (A&S)	54.6	59.3	57.1	57.2	57.7	57.0	57.6	54.5	56.6
61	Pre-Major (A&S)	53.6	59.9	56.8	56.5	57.2	56.9	52.0	50.6	51.6
9	Architecture	51.3	58.6	54.7	54.0	59.8	56.7	53.0	46.9	50.4
11	Business*	52.8	62.7	57.6	57.7	56.4	56.7	50.0	46.9	48.7
36	Education	52.3	57.9	55.2	54.7	53.2	53.8	52.7	52.1	52.9
22	Engineering	54.8	58.3	56.9	58.3	65.8	62.5	49.4	47.0	48.3
14	Nursing	49.5	56.1	53.1	59.4	54.6	56.7	55.0	49.3	52.4
18	Others									
333	Total	54.2	60.0	57.3	59.1	59.4	59.3	53.5	51.4	52.8

*Included in Business are six Pre-BA majors in the College of Arts and Sciences.

Table 5

Intercorrelations among Test Scores, Credits, GPA's, and Sex for Students Taking CLEP General Examinations (N=333)*

	His Sub	Soc Sci Sub	SS& His Tot	Bio Sub	Phy Sci Sub	Nat Sci Tot	Fin Art Sub	Lit Sub	Hum Tot	Soc Sci Crd	Nat Sci Crd	Hum Crd	Soc Sci GPA	Nat Sci GPA	Hum GPA	HS GPA	UW GPA	Female
His Sub	--	71	93	41	44	45	38	54	52	13	08	-01	19	24	06	13	27	-28
Soc Sci Sub	71	--	90	51	49	52	34	48	46	15	09	-05	25	34	15	26	36	-20
SS & His Tot	93	90	--	51	52	54	40	56	54	14	11	-04	23	31	11	22	34	-27
Bio Sub	41	51	51	--	73	92	34	39	41	-21	47	-11	22	40	18	35	41	-17
Phy Sci Sub	44	49	52	73	--	93	28	32	33	-31	56	-20	05	42	02	31	39	-40
Nat Sci Tot	45	52	54	92	93	--	33	36	38	-30	56	-17	14	44	10	36	42	-32
Fin Art Sub	38	34	40	34	28	33	--	63	89	-01	-07	30	19	12	25	20	24	16
Lit Sub	54	48	56	39	32	36	63	--	91	13	-09	30	29	22	27	21	30	08
Hum Tot	52	46	54	41	33	38	89	91	--	07	-09	33	27	18	29	23	30	13
Soc Sci Crd	13	15	14	-21	-31	-30	-01	13	07	--	-67	14	33	-11	18	-14	-14	12
Nat Sci Crd	08	09	11	47	56	56	-07	-09	-09	-67	--	-56	-12	30	-10	26	21	-35
Hum Crd	-01	-05	-04	-11	-20	-17	30	30	33	14	-56	--	23	-05	48	01	13	32
Soc Sci GPA	19	25	23	22	05	14	19	29	27	33	-12	23	--	29	50	19	42	14
Nat Sci GPA	24	34	31	40	42	44	12	22	18	-11	30	-05	29	--	-10	46	72	-06
Hum GPA	06	15	11	18	02	10	25	27	29	18	-10	48	50	-10	--	34	48	26
HS GPA	13	26	22	35	31	36	20	21	23	-14	26	01	19	46	34	--	56	12
UW GPA	27	36	34	41	39	42	24	30	30	-14	21	13	42	72	48	56	--	07
Female	-28	-20	-27	-17	-40	-32	16	08	13	12	-35	32	14	-06	26	12	07	--

*Decimal points omitted.

Figure 2

Mean Scores on Three General CLEP Examinations and Credits Earned in Corresponding Subject Areas

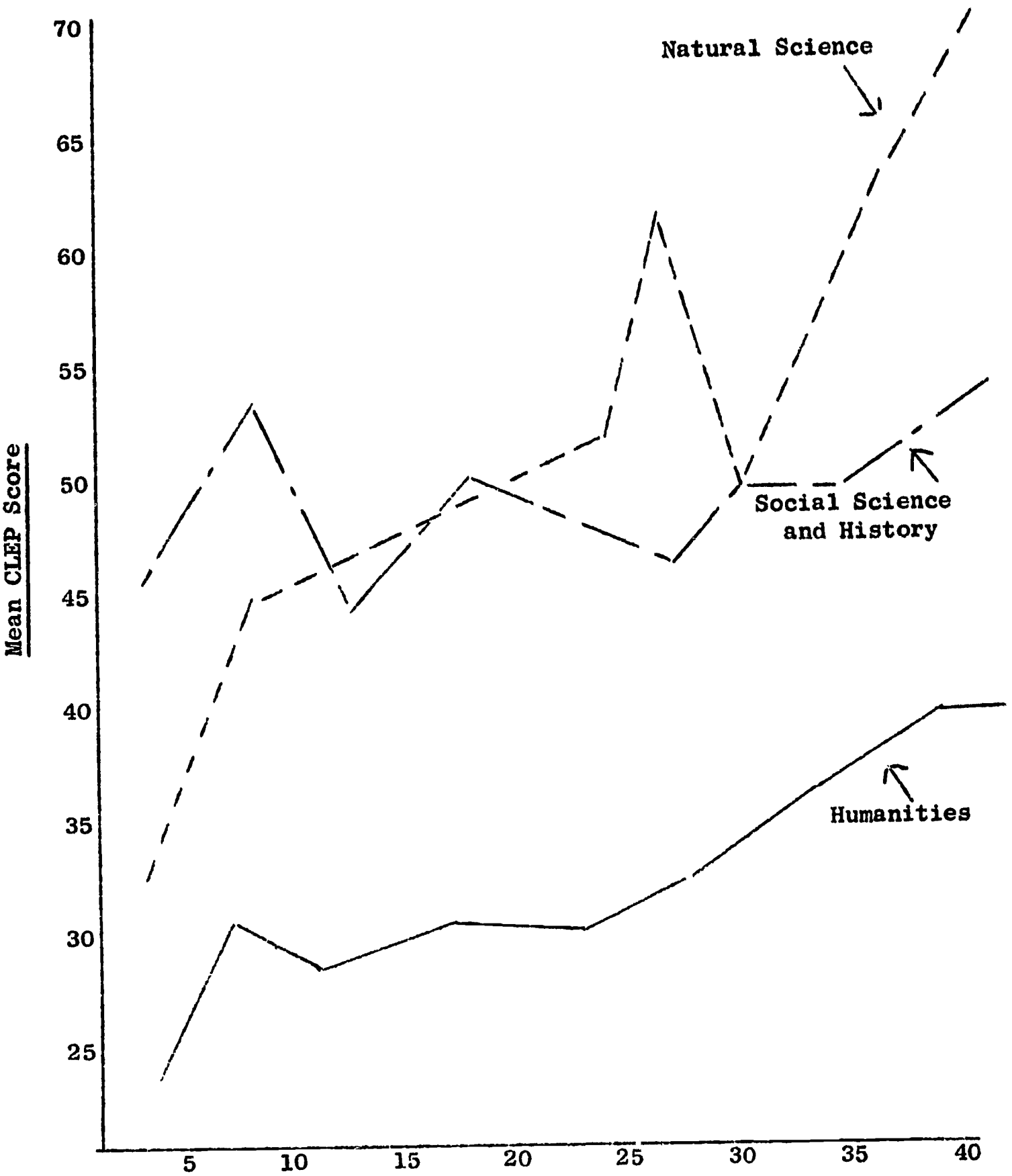

Table 6

Arts and Sciences Majors Ranked by Mean CLEP Score and Subject Area Credits

		Rank					
N	Major	SoSci &Hist Score	SoSci Crdts	NatSc Score	NatSc Crdts	Hum Score	Hum Crdts
6	Anthropology	3	8	5	8	2	9
4	Art	18	14	19	20	7	1
13	Chemistry	12	20	4	2	15	19
6	Economics	2	3.5	17	16	20	11
8	English	8	9	8	15	1	5
4	Far East	19	11	20	11	19	4
4	German	14	12	7	11	3	3
6	History	7	1	11	14	9.5	12
4	Home Economics	16	13	16	13	13	10
11	Journalism	10	3.5	15	19	8	8
9	Mathematics	17	18	6	5	6	7
11	Oceanography	4	18	1	1	5	20
6	Political Science	1	2	12	18	4	13
6	Pre-Business	11	10	10	7	18	16
7	Pre-Law	9	6.5	9	17	16.5	6
61	Pre-Major	15	6.5	14	6	16.5	15
11	Pre-Medicine	5.5	16.5	3	4	12	17
5	Sociology	13	5	13	9	11	14
5	Spanish	20	16.5	18	11	14	2
14	Zoology	5.5	15	2	3	9.5	18

Table 7

Maximum Number of Allowable Credits (10, 20, or 30) for Intervals of Credits Completed and Raw Score Intervals on the Three General CLEP Examinations

	Credits Completed				
Social Science-History Exam Score	0-9	10-14	15-19	20-29	30+
0-34	*	*	*	*	*
35-44	10	*	*	*	*
45-54	10	20	20	*	*
55	10	20	30	30	*
56-64	20	20	30	30	*
65+	30	30	30	30	*
Natural Science Exam Score					
0-35	*	*	*	*	*
36-45	10	*	*	*	*
46-54	10	20	20	*	*
55-64	10	20	30	30	*
65-75	20	20	30	30	*
76+	30	30	30	30	*
Humanities Exam Score					
0-16	*	*	*	*	*
17-25	10	*	*	*	*
26-35	10	20	20	*	*
36-40	10	20	30	30	*
41-50	20	20	30	30	*
51+	30	30	30	30	*

*-No credits waived, i.e., maximum number of allowable credits does not exceed credits already completed.

Table 8

Raw Score and Percentile Equivalents for the Three General CLEP Examinations (N=333)

CLEP Raw Score	SocSc &Hist %tile	NatSc %tile	Hum %tile
100			
99			
98			
97			
96			
95			
94		99+	
93		99	
92		99	
91		99	
90		99	
89		99	
88		98	
87		98	
86		98	
85		98	
84		97	
83	99+	96	
82	99	95	
81	99	94	
80	99	94	
79	99	93	
78	99	93	
77	99	91	
76	99	90	
75	98	89	
74	98	88	
73	98	87	
72	97	86	99+
71	97	85	99
70	96	83	99
69	95	80	99
68	95	80	99
67	94	79	99
66	92	77	99
65	90	75	98
64	89	74	98
63	85	68	97
62	85	68	97
61	83	67	97
60	82	64	97
59	80	62	97
58	78	60	97
57	76	59	96
56	74	57	96
55	71	55	95
54	68	53	94
53	65	50	93
52	63	48	92
51	62	46	90
50	59	45	89
49	55	43	89
48	52	40	87
47	48	36	86
46	45	33	84
45	43	32	83
44	40	29	81
43	37	27	79
42	34	26	77
41	31	26	73
40	28	23	71
39	26	19	70
38	23	17	68
37	19	15	65
36	18	14	64
35	16	13	59
34	15	12	56
33	14	10	53
32	11	10	51
31	09	09	48
30	08	09	45
29	07	08	42
28	05	08	40
27	04	06	36
26	02	06	34
25	02	05	32
24	02	05	28
23	02	04	26
22	02	04	23
21	01	03	21
20	01	03	19
19	<01	03	16
18		02	14
17		02	11
16		02	09
15		01	08
14		01	07
13		01	06
12		01	05
11		01	03
10		01	02
9		01	02
8		<01	02
7			01
6			01
5			< 01
4			
3			
2			
1			
0			

Table 9

Raw Score and Percentile Equivalents for the Subscores of the Social Science and History General CLEP Examination (N=333)*

CLEP Raw Score	Hist Subsc %tile	SocSc Subsc %tile	CLEP Raw Score	Hist Subsc %tile	SocSc Subsc %tile
60			29	76	31
59			28	74	26
58			27	71	21
57			26	66	20
56			25	63	17
55			24	58	14
54			23	55	09
53			22	49	07
52			21	45	06
51		99+	20	41	04
50		99	19	34	03
49		99	18	30	02
48		99	17	25	02
47		97	16	22	01
46		97	15	19	01
45		96	14	16	01
44	99+	95	13	12	<01
43	99	92	12	10	
42	98	88	11	05	
41	98	86	10	04	
40	98	84	9	02	
39	98	82	8	02	
38	97	78	7	01	
37	95	73	6	01	
36	94	66	5	<01	
35	91	62	4		
34	90	56	3		
33	89	50	2		
32	86	43	1		
31	83	40	0		
30	78	35			

*The social science subscore has 60 items and the history subscore has 55 items.

Table 10

Raw Score and Percentile Equivalents for the Subscores of the Natural Science General CLEP Examination (N=333)*

CLEP Raw Score	Biol Subsc %tile	PhySc Subsc %tile	CLEP Raw Score	Biol Subsc %tile	PhySc Subsc %tile
55			27	44	45
54			26	39	42
53		99+	25	38	39
52	99+	99	24	33	35
51	99	99	23	30	30
50	99	99	22	28	26
49	99	98	21	23	23
48	99	98	20	20	19
47	98	97	19	15	17
46	96	96	18	13	14
45	96	95	17	11	12
44	95	93	16	09	10
43	92	92	15	08	08
42	92	90	14	08	07
41	90	87	13	07	06
40	89	85	12	05	05
39	88	82	11	04	03
38	86	78	10	04	02
37	83	76	9	03	02
36	80	75	8	02	02
35	79	69	7	02	01
34	76	66	6	02	<01
33	71	64	5	01	
32	68	62	4	01	
31	64	59	3	<01	
30	58	57	2		
29	53	54	1		
28	49	49	0		

*The physical science subscore has 55 items and the biological science subscore has 54 items.

Table 11

Raw Score and Percentile Equivalents for the Subscores of the Humanities General CLEP Examination (N=333)*

CLEP Raw Score	FiArt Subsc %tile	Lit Subsc %tile	CLEP Raw Score	FiArt Subsc %tile	Lit Subsc %tile
57			28	90	92
56			27	89	90
55			26	86	88
54			25	83	86
53			24	79	83
52			23	75	80
51			22	72	77
50			21	68	74
49			20	64	68
48			19	59	64
47			18	56	61
46			17	52	57
45			16	46	52
44			15	41	45
43			14	36	41
42			13	31	37
41	99+		12	26	32
40	99	99+	11	25	27
39	99	99	10	21	22
38	99	99	9	18	17
37	99	99	8	14	14
36	99	98	7	09	10
35	99	98	6	05	08
34	98	97	5	04	07
33	97	96	4	01	05
32	96	96	3	01	04
31	96	94	2	01	02
30	95	94	1	01	01
29	92	93	0	<01	<01

*The literature subscore has 57 items and the fine arts subscore has 50 items.